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5. Palpi close-scaled and closely upturned to middle of front, the third joint sometimes porrect in death; scales rather narrow as in *Entephria*, with obscure wave-markings on fore wing, §37.....**indefinata**.

5. Palpi moderate, rough, beaklike, hind wings more distinctly scalloped, scales normal, §38.

neomexicana, australis, etc.²

4. Small, brown with many nearly straight transverse lines, outer margins even; no coremata.

Percnoptilota (?) multiferrata.

The following papers contain keys to the genera of *Hydriomeninæ*:

MEYRICK, E.: A monograph of the New Zealand Geometrina, Trans. N. Z. Institute, 16, 49, 1883. This is the fundamental paper on which our present classification is based.

MEYRICK, E.: Revision of Australian Lepidoptera, IV, Proc. Linn. Soc. New South Wales (2), 5, 791, 1890.

MEYRICK, E.: On the Classification of the Geometrina of the European Fauna, Trans. Ent. Soc. Lond., 1892 (1), 53, 1892.

HAMPSON, G. F.: The Fauna of British India, Moths, III, 329, 1895.

HULST, G. D.: A classification of the Geometrina of North America, Trans. Am. Ent. Soc., 23, 245, 1896.

NOTES ON OSTEN SACKEN'S GROUP "PÆCILANTHRAX," WITH DESCRIPTIONS OF NEW SPECIES.

BY FRANK R. COLE,

WASHINGTON, D. C.

The species in this group of *Bombyliidæ* are very difficult of characterization and it may be that some of the described species are local varieties or races. I have had a good series of most of the species to work with. Mr. Knab loaned the National Museum collection in this group which made up a large part of my material, and Mr. Banks and Mr. Walton have loaned me specimens. In the preparation of this paper I am greatly indebted to Mr. Banks for compar-

² *Scotosia gobiata* of New Zealand would run here and may really be related.

ing a number of specimens with the types in the Museum of Comparative Zoology at Cambridge, and for many suggestions in separating the different species. Mr. J. M. Aldrich kindly sent me notes on the specimens of this group in his collection. There are several specimens in the National Museum which I left unnamed, their position being at present uncertain, on account of the lack of material.

Osten Sacken was I believe the first to call attention to the related forms of Anthrax grouped around *A. halcyon* Say, the first instance being in Western Diptera, p. 239. In the Biologia (Diptera, Vol. 1) he defines this group and refers the following species to it: *halcyon*, *arethusa*, *alpha*, *poecilogaster*, *ceyx*, *flaviceps*, and *fuliginosa*. Osten Sacken gives the following distinguishing characters for these species: "the Exoprosopa-like front legs (short; tibiæ without spinules; tarsi very gently tapering, with rather indistinctly marked joints, and a delicate pubescence of erect hairs on both sides; ungues very small); the face conically produced, the proboscis not projecting beyond the oral margin; the third joint of the antennæ in the shape of an irregular cone, gradually tapering off into a long point (but not a style). The coloring of the wings characteristic, brown, with a clear space at the apex, traversed by the more or less clouded 'S'-shaped anterior branch of the third vein; a clear space in the discal cell, more or less connected with the posterior margin; supernumerary cross-veins often occur, bisecting either the third posterior or the second submarginal cell; a stump of a vein in the third posterior cell is very often present. Another peculiarity of this group is that the impressed line which, in most species of *Anthrax*, issues from the emargination of the occipital orbit, and crosses a portion of the eye, is very short and almost obsolete here."

Osten Sacken gives this group the name "*Pœcilanthrax*." As to structural characters, there is practically no variation, although size may prove a good character. The coloring and pattern of the wings varies in specimens of the same species, but the general design is constant and characteristic of the species. The small stumps of veins occurring quite often are variable, as are supernumerary cross-veins. Very little can be added to Osten Sacken's characterization of "*Pœcilanthrax*." The species are all comparatively large and all the species known have black pile on the sides of the abdomen, usually in tufts

near the posterior margins of the segments. This group is known only from America. The habits and early stages of species are not known. The life history is no doubt similar to that of other species of *Anthrax*.

Anthrax californicus new species (fig. 2).

This species resembles *A. alpha*. The general color is grayish black, with a blue tinge on the thorax. There is a round red spot on the lateral margin of both the second and third segments. All the segments except the first have black pile on the posterior border. With the exception of the posterior border the segments are covered with whitish pile and tomentum. The pile on the sides of the abdomen is quite long and bushy (see fig. 3). Scutellum reddish brown, the base black. Occiput black, with sparse white tomentum. Short black pile on frons, which continues below base of antennæ. First joint of antennæ reddish, the second and third black (see fig. 14). Base of front femora blackish, also the tarsi and tips and inner sides of tibiæ. The first three segments of the venter reddish, the rest black. Pile of thorax pale yellow, the spines yellow. Pleuræ black, the pile whitish. Wing markings very much as in *alpha*, the light spaces smoky hyaline. No supernumerary cross vein. Very short stump of a vein in third posterior cell, arising near second posterior cell.

Type.—U. S. N. M., Cat. No. 20737—Four specimens.

Habitat.—East Highlands, Cal., Sept. 21, 1914.

A specimen from Reno, Nev., Sept. 2, 1916 (H. G. Dyar), has more white tomentum on the dorsum of the abdomen. There is less white pile on the abdomen and no red spots on the second and third segments. The legs are all blackish, except the knees, the femora and tibiæ with white tomentum. One specimen from Las Cruces, N. M., Sept. 27 (Townsend).

Anthrax halcyon Say (fig. 2).

Anthrax alcyon Say, Complete Works, Vol. 1, p. 252.

"Wings brown, a hyaline spot near the middle, another at the tip in which are two curved brown lines.

"Inhabits Northwest Territory,

"Body black, with pale fulvous hair; head yellowish-white, hairs above the antennæ black; tip of the hypostoma prominent, and with rigid black hairs; antennæ black, basal joint yellowish with black hairs; vertex black; occiput with a very profoundly impressed line above; scutel piceous; wings dusky, pale brown on the disk, an obsolete, small, subhyaline spot between the middle and the base; a large, subtriangular, hyaline spot near the middle, a small portion of

which is cut off by a nervure; tip with a large, subquadrate oval, hyaline spot, the two arcuated nervures that pass through this spot are margined with blackish; central cellule widely bilobated at the tip, lobes equally approaching the inner margin, a nervure passes from between the lobes to the edge of the wing, an abbreviated nervure passes from the lobe nearest the base, half way to the inner margin, and another nervure connects this lobe with the inner nervure so as to form an additional cellule; feet yellowish; tarsi black; venter pale, two last segments black on the disk; tergum with blackish hair on the incisures."

Say's description does not omit any important characters. *Halcyon* is easily distinguished by having the third posterior cell bisected by a cross vein. The average length is about 13 mm. This species has a very wide range, and I have records of it from Kansas, Nebraska, Colorado, New Mexico, South Dakota (Aldrich), Michigan (Aldrich), Toronto, Ontario (Aldrich), and Southern California. Two specimens in the National Museum (Townsend, 827) from Chihuahua, Mexico, apparently belong here, although they differ somewhat from the typical forms.

Anthrax nigripennis new species (figs. 4 and 5).

This species is near *halcyon*, but the wings are much darker, and areas which are blackish gray in *halcyon*, are deep black in this species. There is a semi hyaline spot in the discal cell, and the usual hyaline spaces in the wing tip are dark, smoky and very narrow. The axillary cell is dark brown, in some specimens blackish. Dorsum of abdomen reddish with a broad black median stripe (see fig. 4), the red in round spots on the sides of each segment. First segment black. Scutellum dark red, the base black. Mesonotum grayish black. In fresh specimens there are indications of gray vittæ on the thorax. Humeral and post alar callosities brownish red. Black pile on distal half of segments 2 to 7, in tufts on the sides. The first two antennæ joints are yellowish red, the third black (fig. 21). Length 12 mm. Wing 13.5 mm.

Type.—U. S. N. M., Cat. No. 20739.

Habitat.—Beltsville, Md. Four specimens were taken July 2 and 4, 1916 (W. R. Walton). Three specimens were collected July 9 in the same locality by the author. Mr. Banks loaned two specimens, one from Falls Church, Va. (June 24), the other from Glencarlyn, Va. (July 2).

Anthrax arethusa O. S. (figs. 11 and 11a).

Anthrax arethusa O. S., Biologia, Dipt., 1, 116.

"A series from Central America and Mexico resemble *halcyon* in having their third posterior cell bisected, but show a marked difference. *A. halcyon* has a more northern distribution. The sides of the abdomen of *halcyon* beset with yellow pile, but on the distal half of the segments, beginning in most specimens with the third, there is a tuft of black pile. The bisecting cross vein is often wanting from both wings, sometimes from one wing only.

"*Arethusa* differs from *halcyon*: Abdomen red on the sides on all segments; the black forms a broad stripe in the middle, occupying all of the first segment, and is gradually attenuated posteriorly. On the seventh segment the black occupies but a small spot in the middle. The wings are narrower and paler; the interval between the hyaline spot in the discal cell and the posterior margin is almost altogether hyaline, crossed by two veins the second of which is more or less clouded; the cross vein bisecting the third posterior cell is differently placed; in *halcyon* it connects the end of the discal cell with the intercalary vein, and the stump does not come in contact with it; in *arethusa* it connects the intercalary vein with the stump, so that the latter seems to issue from the curve of the cross vein; in some cases the end of the stump disappears, and then the convex cross vein remains.

"In both species the subhyaline spot commonly occurring in species of *Anthrax* near the proximal end of the discal cell is nearly obsolete; in this they differ from *pæcilogaster*.

"In size the average *arethusa* is a little smaller and narrower than *halcyon*. I have six specimens from Guatemala City, five from Irazu, two from N. Sonora, two from Presidio and one from Orizaba. A specimen from Manitou, Colo. (Aug. 17, 1876), seems to belong here, it is larger, the black dorsal stripe of the abdomen is remarkably narrow, and the tufts of black hair on the sides of the abdomen consist of a few hairs only, hardly visible among the yellow hairs."

Anthrax arethusa var. **autumnalis** new variety (fig. 8).

This species answers the description of *arethusa* very well, but does not have the supernumerary cross vein bisecting the third posterior cell. The specimens in my collection are very close to *willistoni* Coq., in general appearance and wing markings. The venter is pale reddish. The specimen figured

has a somewhat narrower black stripe on the abdomen than the average. Length 12-15 mm.

Type.—U. S. N. M., Cat. No. 20741.

Habitat.—Redlands, Cal. Several specimens, all collected in September. The species is very common in this region.

***Anthrax effrena* Coq. (fig. 7).**

"*Anthrax effrena* Coq., Trans. Amer. Ent. Soc., XIV, 182.

Differs from *alpha* only as follows: Proboscis not projecting beyond epistoma. Wings wholly dark brown, except a large hyaline spot near the middle of discal cell encroaching on third posterior cell, a less distinct spot in the middle of the fourth posterior cell and the entire apex of the second submarginal cell; basal half of the third vein and basal two thirds of the sixth vein light yellow. Length 12 mm."

"Arizona. A single specimen (Williston)."

This species varies from 9-17 mm. in length. All of the material in the National Museum is from Arizona. One small specimen (9 mm. in length) is probably immature. The wing color is pale and indefinite. The abdominal markings seem to vary considerably. The legs are yellowish red. The first two joints of the antennæ are yellowish, the third joint black (fig. 20). Coquillett compared this species with *alpha* but could not have had a correctly determined specimen of *alpha*. The two species do not resemble each other to any extent.

***Anthrax alpha* O. S.**

Anthrax alpha O. S., West. Dipt.

Osten Sacken gives a very good description of this species in his Western Diptera. "Coloring of the wings very like that of *A. halcyon*; second submarginal cell bisected by a cross-vein; in the third posterior, a long stump of a vein. Length 12-14 mm.

"Front, face, and cheeks beset, the former with short black, the two latter with scarce yellow pile; venter black; proboscis not projecting; antennæ black, first joint reddish, with black pile. Thorax grayish black, clothed with pile, which is pale fulvous above and white on the pectus and lower part of the pleuræ. Scutellum reddish, black at base; ground color of the abdomen is grayish black; in rubbed-off specimens only a little red is perceptible on the sides of the second and third segments; in well preserved specimens, the ground color is entirely concealed under a dense, appressed tomentum which is whitish gray on the anterior and brownish fulvous on the posterior half of the segments; an ill-defined blackish spot in the middle of each segment; the

sides of the first two segments are beset with yellowish white pile; the sides of the following segments, beginning with the end of the second, with black, mixed with fulvous pile, the black forming tufts on the hind margins of the segments; the same black pile is scattered over the surface of the abdomen, above the tomentum. Venter: segments 2 to 4 reddish, more or less black at the base; the following segments black, with a reddish posterior margin. Legs red with a golden yellow tomentum and black spines; front femora black at the base; tips of the tibiæ and all the tarsi black. Wings tinged with blackish brown; in the apical half, the following spaces are grayish hyaline: a spot in the expanded end of the marginal cell, the end of the first submarginal and nearly the whole second submarginal cell, a streak in the end of the first posterior cell, the three other posterior cells, and the latter half of the discal cell; the veins traversing these subhyaline spaces are clouded with brown. The cross vein bisecting the second submarginal cell is placed in its narrow part, so as to form with the adjacent veins the figure 'A.'

"*Habitat*.—Cheyenne, Wyo., where I found it to be quite common, Aug. 21, 1876. Five specimens.

"Six specimens from near Webber Lake, Sierra Nevada (July 25), agree in all respects with those from Cheyenne; but they are a little smaller, the coloring is a little darker, both on the wings and on the body; the pile on the chest and pleuræ is less white; the tomentum on the abdomen above is the same, but the fulvous prevails over the gray, and the black spots in the middle of each segment are larger, on the second segment, along the hind margin, the black forms a cross band; attenuated on each side, and not reaching the lateral margin; the same is repeated on each following segment, the black spot rapidly diminishing in extent. The venter is reddish without any black at the base of the segments. The portion of the anterior branch of the third vein beyond the supernumerary cross-vein is very distinctly clouded with brown in these specimens while it is not clouded at all or only imperceptibly in the specimens from Cheyenne. I hold this to be merely a local variety of *alpha*."

Coquillett redescribed *alpha* in the Trans. of the Amer. Ent. Soc., XIV, p. 180, and evidently from specimens of another species. The second joint of the antennæ is not red as he says and the wings are not yellowish brown. *Alpha* does not have the "sides of the abdomen sometimes partly or wholly reddish." He makes no mention in his description of the fact that the bases of the fore femora are black.

I have five specimens, from the following localities: Colorado (2 specimens, one from Rocky Ford); Summit, Sierra Nev., Cal.; Wy-

oming and Medicine Hat, Alberta, Canada, Oct., 1911 (J. R. Malloch).

Anthrax signatipennis new species (fig. 10).

Thorax opaque gray black. Abdomen red with a median dorsal black stripe, which varies in width in different specimens and does not reach the end of the seventh segment. The first segment is all black. Scutellum reddish, the base black. Vertex black. The black of the occiput varies in extent. Venter reddish yellow. Tomentum of mesonotum golden yellow. In most of the specimens the yellow tomentum of the abdomen is sparse. Front and epistoma with short black pile varying somewhat in extent, the rest of the pile on the head is pale yellow. The tufts of black pile on the sides of the abdominal segments are quite noticeable. Wings brown, marked with hyaline spots (see fig. 10). The hyaline spot in the middle of the wing is quite often narrow and does not reach the wing margin. The anal and axillary cells are both dark brown. Legs yellowish with black bristles, the tarsi darker, especially the front pair. First two joints of antennæ yellowish red, the last joint black (fig. 19). Length 10.5 to 13 mm.

Type.—U. S. N. M., Cat. No. 20740. Seven specimens. All in U. S. N. M.

Habitat.—Type from Yellowstone Park, Aug 12, 1907 (W. Robinson). One specimen from Miles City, Montana, Aug. 24, 1915. Three specimens from Reno, Nevada, Sept. 2, 1915 (H. G. Dyar).

The Nevada specimens differ slightly, one having more gray color to the wings, the hyaline spots being smoky. In the other two specimens the dorsum of the thorax, abdomen and scutellum is thickly covered with yellow tomentum. Mr. Nathan Banks compared these specimens with material in Museum of Comparative Zoology and found them to be identical with specimens labelled "new species" by Osten Sacken, from Shasta Co., Cal.

Anthrax willistoni Coq.

Anthrax willistoni Coq., Trans. Amer. Ent. Soc., XIV, 181.

Coquillett mentioned as a synonym of this species, *Anthrax* sp. nov., near *fuliginosa* Lw. Williston, Can. Ent., Vol. XI, p. 216.

"Differs from *alpha* in that the middle part of the veins between the first and second submarginal cells and between the discal and third posterior cell, and sometimes that between the third and fourth posterior cells are not bordered with brown, and the axillary cell, except its base and apex is wholly hyaline." Length 11 to 14 mm. Cal., N. M., Colo. 4 specimens.

This species is near *pæcilogaster* O. S. and *arethusa* O. S. A specimen labelled "Near Lander, Wyo., 5,000–8,000 ft. Aug. (Roy

Moodie)," has the brown of the wings very pale. This may be an immature specimen. All the abdominal segments except the first have short white tomentum mixed with the usual yellow tomentum. In most specimens the tarsi are dark. This species does not have the base of the front femora dark as in *alpha*. Some specimens have the lateral margins of all segments except the first reddish.

Anthrax pæcilogaster O. S. (fig. 12).

Anthrax pæcilogaster O. S., Biologia, Dipt., 1, 118.

"Head yellowish, almost wax-color, with appressed golden pubescence, and black, erect hairs; vertex black, the upper part of the occiput grayish, beset with pale orichalceous appressed hairs; basal joints of antennæ reddish, third joint black. Thorax grayish-brown, with an appressed fulvous pubescence forming a pair of indistinct stripes in the middle, and longer, erect fulvous hairs in front and on the sides (when the pubescence of the dorsum is not abraded and the surface not greasy, two dark stripes are visible on the grayish-brown background). The scutellum reddish, black at the base. First segment of abdomen black, the others rufous, with a transverse black spot in the middle of each, beginning with the second (these spots visible in abraded specimens only). The hairy covering of the abdomen consists of a partly rufous, partly yellowish white tomentum, the latter predominating on the sides and on the anterior part of the second segment. In well-preserved specimens, in the middle of each of the segments 2, 3, and 4, there is a short, tuftlike crossband of black hairs, broadly interrupted in the middle, the interruption being filled with a whitish tomentum; tufts of black hairs along the abdomen, beginning with the second segment; legs rufous, the tips of the tarsi darker. Knob of the halteres whitish. Wings on the pattern of *halcyon*, but narrower; a stump of a vein within the third posterior cell; a hyaline spot close by the axillary incision across the middle of the axillary cell, sometimes reaching the anal cell also; the ends of the second and upper branch of the third vein thickly clouded with brown; the hyaline space in the discal cell rather large and in contact with the fourth vein; the hyaline space connecting this spot with the posterior margin rather clear, the intercalary spot at the distal end of the second basal cell very distinct; the brown color not very dark and variegated with yellowish rufous. Length 11 to 12 mm.

"*Habitat*.—North America, Cal., Mexico, N. Sonora, Tehuacan. Seven specimens.

"*Pæcilogaster* differs from *arethusa* as follows: (1) Third posterior cell is not bisected, but contains a stump of a vein; (2) the black tufts on the sides of the abdomen are very distinct on the second, as well as on the following segments; (3) the hyaline spot in the distal half of the second basal cell near the proximal end of the discal cell is not obsolete, but very distinct; (4) there is a more

or less distinct hyaline spot across the axillary cell, close to the axillary incision, and reaching sometimes into the second basal; (5) the well preserved specimens show, on segments 2, 3, and 4 of the abdomen, short, tuftlike interrupted crossbands of dark hairs, easily abraded. I notice that in all my specimens the ends of second vein and anterior branch of third are distinctly diverging, while they are more or less parallel in *arethusa*.

"I have 5 specimens from Shasta, Cal. (Edwards), which somewhat resemble *pacilogaster*, but are, on the average, a little larger and broader, the axillary cell, the hyaline spots in the third and fourth posterior cells smaller; the tomentum on the abdomen is principally yellow and not mixed white. The third posterior cell is not bisected, but has a stump of a vein (as in *pacilogaster*). Is this again, a different species?"

Mr. Banks noted this unnamed species in the collection at the Museum of Comparative Zoology and says that it is the same as *willistoni*, Coq., near which it is placed.

***Anthrax pilosa* new species.**

Body color dull grayish black. The abdomen is almost entirely obscured by dull yellow pile, beneath which is a yellow tomentum. The incisions have a few black hairs, and there are a few at the sides of each segment. The hind borders of segments 2 to 6 are banded with a yellow brown tomentum. There is a band of black tomentum on the second segment which does not reach the lateral margins, a still smaller band on the third segment. Spines of the thorax and scutellum yellow, the pile and tomentum yellow. Vertex black. Frons and epistoma with very sparse black pile and yellow tomentum. Basal joints of the antennæ reddish, the third joint black and slightly longer than the first two (fig. 15). Legs yellowish red, the tarsi darker. Coloring of wings very pale yellowish brown and not sharply defined. The smoky hyaline spaces blend in with the wing pattern. Occiput black with yellowish white tomentum. Venter blackish, the hind margins of the first two segments marked with red. The type has a small red spot on each side of the second segment. Scutellum red, the base and sides black.

Type.—U. S. N. M., Cat. No. 20738. Four specimens.

Habitat.—Los Angeles Co., Cal.

This species is nearer *fuliginosa* than any other. The four specimens in the National Museum were collected by Coquillett and labelled *A. alpha* with a query.

Anthrax flaviceps Loew.

Anthrax flaviceps Loew., Cent. VIII, 132.

I give below a rather free translation of Loew's description in his Centuries: "Black, opaque. Head yellow, vertex and occiput black, frons and face with black pile and yellow tomentum, the oral margin in front furnished with short black pile; the proboscis not prominent; first antennal joint yellow or brownish, closely black pilose; second joint black, with short black pile; third joint not present in this specimen. Thorax with fulvous pile. Scutellum except base red. Abdomen wholly black, lateral margins with fulvous pile, the pile however is black on the posterior angles of the segments. Dorsum of abdomen wholly yellow tomentose the sides are furnished with yellow pile and the hind margins of the segments with black pile. Venter black, the posterior margins pale and the sparse pile yellow. Legs testaceous, the base of front femora, the tibiæ except base, the rest of the tibiæ to the apex of the tarsi all black. Wings fuscous cinereous, venation similar to *A. halcyon* Say, appendiculate vein from discal cell in third posterior is missing; this cell being in one, not divided in two parts as in *A. halcyon* Say. Adventitious veins sometimes occur; sometimes arising from the intercalary vein.

"From Tamaulipas, Mex. Type in Museum of Comparative Zoology." Mr. Banks notes in comparing specimens that *pilosa* is very near *flaviceps*, but the latter is even more obscurely marked."

Anthrax demorgon Walker.

Anthrax demorgon Walker, List, 2, 265.

"Body black; head clothed with black hairs; ferruginous between the eyes, tawny in front; mouth tawny; feelers and sucker black: eyes dark red: chest and breast, and especially the latter clothed with red hairs; scutcheon ferruginous, excepting the fore border: abdomen dull black, piceous beneath, clothed with red hairs, and having a fringe of black hairs on each side: legs dark ferruginous, beset with black bristles, feet piceous: wings blackish brown, having near the fore border in the middle of the length a large ferruginous spot, which also stretches along the borders of the veins; beneath this there are three colorless spots, which occupy as many areolets, the first nearest to the hind border is small, the second is larger, the third is triangular and larger; beyond the latter and nearer to the hind border there are two very small, and sometimes almost obsolete colorless spots; the tips of the wings are pale gray, excepting two stripes which follow the curves of the veins and are joined together at each end; wingribs and veins piceous; poisers tawny, their knobs piceous above. Length of body 6 lines; of wings 16 lines.

"Florida.

"The fork on the base of the fourth areolet on the hind border, reckoning from the base of the wing, is longer than that of *A. halcyon*."

This is probably the same as *A. ceyx* Lw. *A. ceyx* occurs in Florida and there appears to be no other species which corresponds to the description.

***Anthrax ceyx* Lw.** (Syn.? *demorgon* Walker).

Anthrax ceyx Lw., Cent., VIII, 30.

Coquillett redescribed *A. ceyx* in Trans. Amer. Ent. Soc., XIV, p. 181. I give his description below:

"Front brownish, the crown black tomentose and pilose; face reddish, much produced below, black tomentose and pilose; proboscis projects length of labella or less beyond epistoma; first joint of antennæ reddish, about three times as long as second, second and third joints black, third joint elongate, conical at base (fig. 17); occiput black, reddish tomentose. Thorax black, reddish tomentose, front end reddish and black pilose, bristles of hind angles reddish and black; pleura reddish and black pilose; scutellum reddish, the base black, reddish tomentose, the bristles reddish and black. Abdomen black, the sides sometimes partly reddish, mixed black and reddish tomentose; pile of sides black, that on sides of first and second segments largely reddish, on the others mixed with a few reddish ones, venter reddish, mixed reddish and black pilose. Legs reddish, sometimes partly black, reddish tomentose, front tibiæ destitute of bristles; tarsi black, claws of front tarsi minute. Wings brownish black, the following parts hyaline; a spot in the apex of marginal cell, a larger spot in apex of first submarginal cell nearly as long as the second submarginal cell, a spot in the center of the second submarginal cell extending nearly the whole length of that cell a streak in apex of first posterior cell, or in the middle of second posterior cell, a spot in the base and another in the apex of the third posterior cell, a spot near the center of the fourth posterior cell and a large spot in apex of discal cell; veins between these hyaline parts bordered with brown; a lighter streak in the middle of anal and another in middle of axillary cell; costal cell brownish; apical half of first basal cell reddish yellow; vein between discal and third posterior cell much bowed downward and emitting a stump of a vein which projects into the third posterior cell. Length 15 mm.

N. Carolina, Va., Ga., Fla. Single specimen (Keen)."

Loew's description is from the ♂. Similar to *halcyon* Say, but color of body and vestiture darker and more obscure. Legs darker, anterior tarsi narrower and longer. (Va.) The femora and tibiæ have black tomentum beneath.

***Anthrax fuliginosa* Lw.**

Anthrax fuliginosa Lw., Cent., VIII, 31.

I have three specimens from Texas which I believe to be the true *fuliginosa*.

Head pale yellow, venter and occiput black. Dorsum of abdomen and thorax grayish black. A red spot on the sides of the second and third abdominal segments. Frons wide, reddish in front of vertex. Frons and oral margin with black pile. Cheeks and face with short yellow pile. Scutellum dull red, the base black. Straw yellow tomentum and pile on thorax and abdomen. Bristles yellow. Legs reddish yellow, the base of front femora, tarsi, tips and innersides of tibiæ black. Bristles of legs black. Venter and body black. Black pile on margins of all except first segment, tufts of black pile on the posterior corners. Black tomentum on base of scutellum. Proboscis barely reaching oral margin. First joint of antennæ reddish, the second and third black (fig. 13). Wings brown, but the color is not sharply defined. No clouds on ends of the branches of the third vein or on the end of the second vein. Most of the axillary cell smoky hyaline, and discal cell with large hyaline spot. A light streak in base of marginal cell, the end of first basal and most of second basal cell yellowish. The end of first posterior and most of the second, third and fourth posterior cells smoky hyaline (fig. 22). Length 15 mm. Wing 17 mm.

Type.—Loew's type was from California.

There are two specimens in the National Museum from Cotulla, Texas, May 12, 1906 (F. C. Pratt.), and one specimen from Texas, with no data. These specimens are remarkable for the spurious veins and stumps of veins in the wings.

The status of this species has been in question for some time. Osten Sacken was not sure of certain of his species which he placed under *fuliginosa*. Coquillett made *fuliginosa* a variety of *alpha* O. S. or a variety of what he considered was *alpha*. Osten Sacken referred to *fuliginosa* a specimen from N. Sonora and one from Texas (Coll. von Roder). Coquillett stated that "*fuliginosa* differs from the typical *alpha* in that the outline of the brown color of the wings is not well defined, the parts of the wing that in *alpha* are pure hyaline are here blackish gray and the veins between the submarginal and posterior cells are not distinctly bordered with brown." In a note he adds "this is but an immature form of *alpha*."

Coquillett had six specimens from California and Texas. From his description and the size of the species (10–13 mm. in length) it is very probable that the specimens from California are those which I describe as *A. pilosa* n. sp. Mr. Nathan Banks compared my Texas specimens with Loew's type (which is rubbed) and finds my determination to be correct.

EXPLANATION OF PLATES.

PLATE 3.

Fig. 1. *Anthrax californicus* n. sp.Fig. 2. *Anthrax halcyon* Say.

PLATE 4.

Fig. 3. Abdomen of *A. californicus* from above.Fig. 4. Abdomen of *A. nigripennis* n. sp.Fig. 5. Wing of *A. nigripennis*.Fig. 6. Wing of *A. halcyon* (local variety).

PLATE 5.

Fig. 7. *Anthrax effrena* Coq.Fig. 8. *Anthrax arethusa* var. *autumnalis* n. var.

PLATE 6.

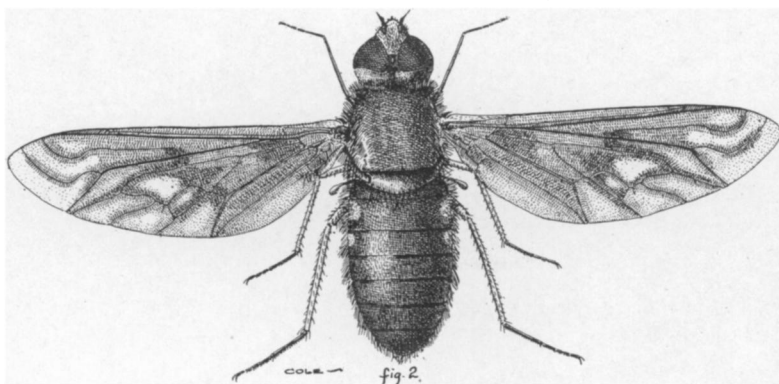
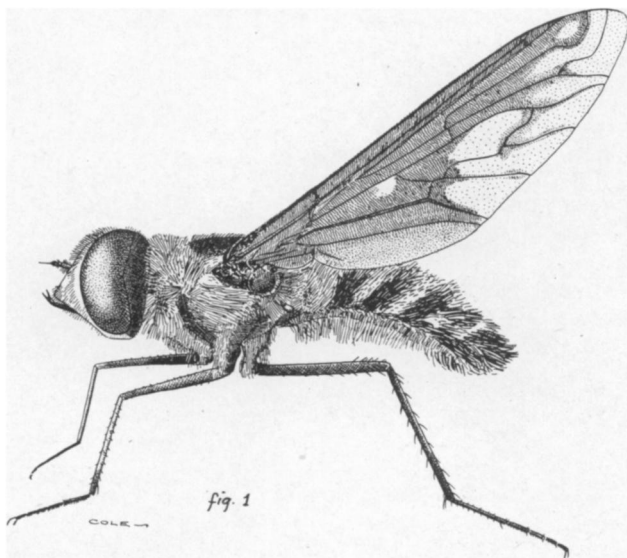
Fig. 9. *Anthrax alpha* O. S.Fig. 10. *Anthrax yellowstonei* n. sp.

PLATE 7.

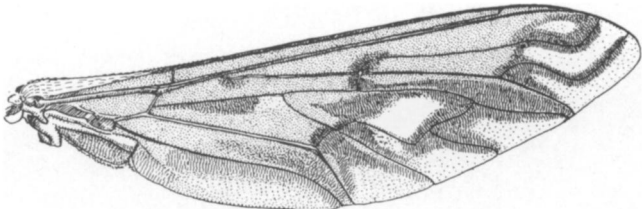
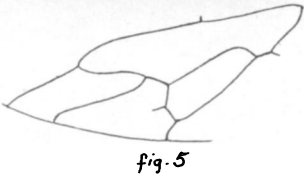
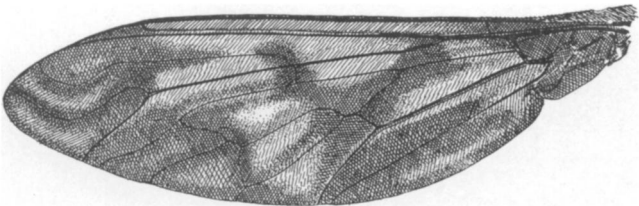
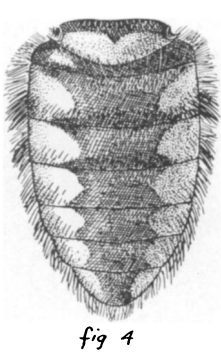
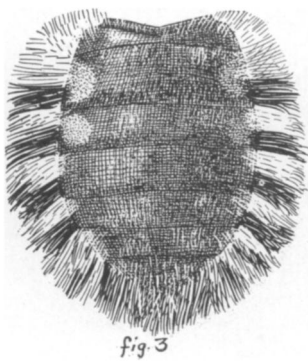
Fig. 11. *Anthrax arethusa* O. S., Abdomen. (Redrawn from Osten Sacken.)Fig. 11a. *Anthrax arethusa* Wing. (Redrawn from Osten Sacken.)Fig. 12. *Anthrax pæcilogaster* O. S., Abdomen. (Redrawn from Osten Sacken.)Fig. 12a. *Anthrax pæcilogaster*, Wing. (Redrawn from Osten Sacken.)Fig. 13. Antennæ of *A. fuliginosa* Loew.Fig. 14. Antennæ of *A. californicus* n. sp.Fig. 15. Antennæ of *A. pilosa* n. sp.Fig. 16. Antennæ of *A. alpha* O. S.Fig. 17. Antennæ of *A. ceyx* Lw.Fig. 18. Antennæ of *A. arethusa* var. *autumnalis* n. var.Fig. 19. Antennæ of *A. yellowstonei* n. sp.Fig. 20. Antennæ of *A. effrena* Coq.Fig. 21. Antennæ of *A. nigripennis* n. sp.Fig. 22. Wing of *A. fuliginosa* Lw.

MISCELLANEOUS NOTES.

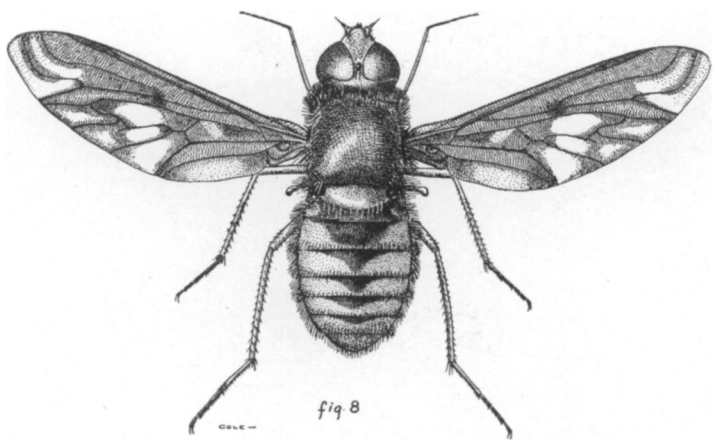
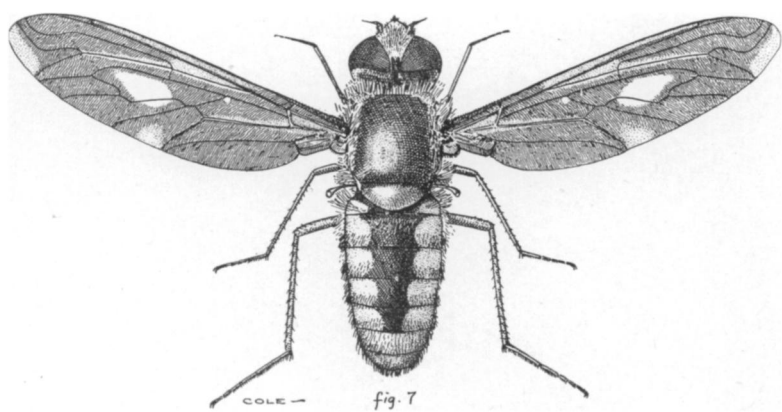
Cardiola obscura Grav. on Staten Island.—I found this aleocharid beetle in some numbers under a pile of decayed weeds in my garden on December 5. Mr. A. S. Nicolay very kindly mounted the specimens for me and sent some to Dr. A. Fényes, by whom the identifi-



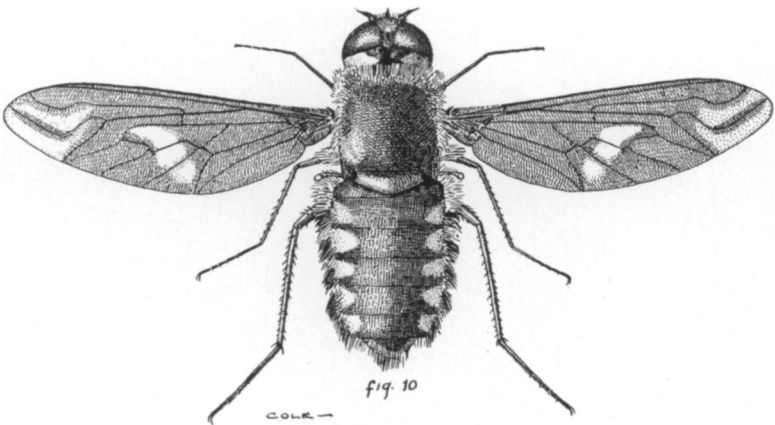
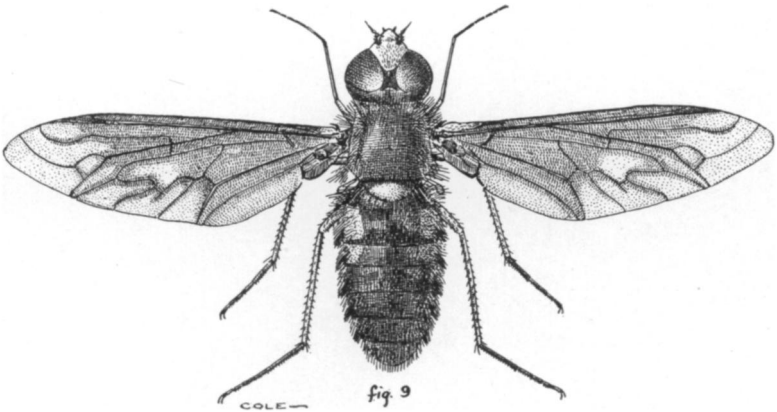
Anthrax.



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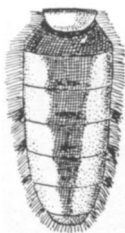


fig 11

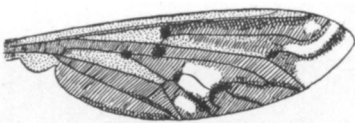


fig. 11a

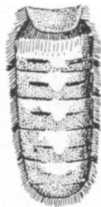
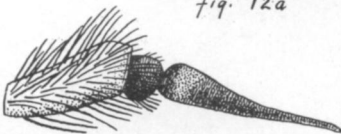


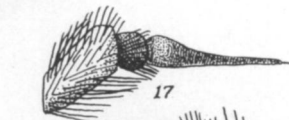
fig 12



fig. 12a



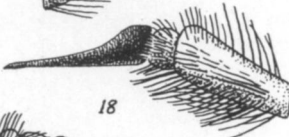
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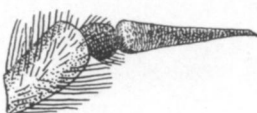
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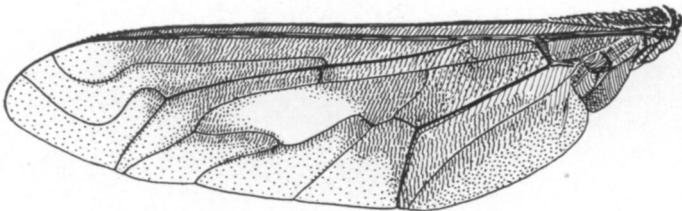
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21



22

Anthrax.